

**THE UNIVERSITY OF CHICAGO**

1. An apparatus for remotely and automatically adjusting the volume of a remotely controlled audio device, comprising:

a sensor circuit for detecting audio signals generated by the audio device and generating a signal representative of an amplitude of the detected audio signal;

a difference circuit for determining a difference between an amplitude of the signal outputted by the sensor circuit and a reference audio signal amplitude and for generating a difference signal that represents this difference; and

a control circuit for generating a control signal that effects at least one of attenuation, augmentation and maintenance of the amplitude of the audio signals generated by the audio device in accordance with the difference signal when the sensor circuit detects an audio signal.

2. The apparatus according to claim 1 wherein the sensor circuit further comprises an amplifier for amplifying the detected audio signal.

3. The apparatus according to claim 1 wherein the sensor circuit comprises a directional microphone for detecting audio signals outputted by the device.

4. The apparatus according to claim 1 wherein the difference circuit further comprises an analog-to-digital-converter for converting the detected audio signals into digital data.

5. The apparatus according to claim 1 further comprising a difference signal transfer circuit that transfers the difference signal to the control circuit when the sensor circuit detects an audio signal.

6. The apparatus according to claim 5 wherein the difference signal transfer circuit comprises a sound activation circuit.

7. The apparatus according to claim 1 wherein the control signal effects attenuation of the amplitude of the audio signals generated by the audio device when the amplitude of the sensor

circuit output signal exceeds the reference audio signal amplitude by a predetermined magnitude.

8. The apparatus according to claim 1 wherein the control signal effects augmentation of the amplitude of the audio signals generated by the audio device when the reference audio signal amplitude exceeds the amplitude of the sensor circuit output signal by a predetermined magnitude.

9. The apparatus according to claim 1 wherein the control signal effects maintenance of the amplitude of the audio signals generated by the audio device when the amplitude of the sensor circuit output signal is generally the same as the reference audio signal amplitude.

10. The apparatus according to claim 1 wherein the control circuit comprises a transmitter circuit for transmitting the control signal to a control signal receiver of the audio device.

11. The apparatus according to claim 1 further comprising a switch that permits a user to activate or deactivate the apparatus.

12. The apparatus according to claim 1 further comprising a sound activation circuit that transfers the difference signal to the control circuit when the sensor circuit detects an audio signal.

13. An apparatus for remotely and automatically adjusting the volume of a remotely controlled audio device, comprising:

a directional microphone for detecting audio signals generated by the audio device and generating a signal representative of an amplitude of the detected audio signal;

a difference circuit for determining a difference between an amplitude of the signal outputted by the directional microphone and a reference audio signal amplitude and for generating a difference signal that represents this difference;

a control circuit for generating a control signal that effects at least one of attenuation, augmentation and maintenance of the amplitude of the audio signals generated by the audio device in accordance with the difference signal; and

a sound activation circuit for transferring the difference signal to the control circuit when the directional microphone detects an audio signal.

14. A method for remotely and automatically adjusting the volume of a remotely controlled audio device, comprising:

detecting audio signals generated by the audio device and  
generating a signal representative of an amplitude of  
the detected audio signal;

determining a difference between the amplitude of the signal generated in the detecting step and a reference audio signal amplitude and generating a difference signal that is representative of this difference; and

generating a control signal that effects at least one of attenuation, augmentation and maintenance of the amplitude of the audio signals outputted by the audio device in accordance with the difference signal if an amplitude of the signal generated in the detecting step is greater than a predetermined amplitude.

15. The method according to claim 14 further comprising amplifying the signal resulting from detecting the audio signal.

16. The method according to claim 14 further comprising determining if the amplitude of the signal resulting from detecting the audio signal is greater than the predetermined amplitude.

17. The method according to claim 14 further comprising converting the signal resulting from detecting the audio signal into digital data.

18. The method according to claim 17 wherein determining further includes:

providing digital data representing the reference audio signal amplitude; and

comparing the digital data representing the amplitude of the signals resulting from detecting the audio signal and the digital data representing the reference audio signal amplitude.

19. The method according to claim 14 further including transmitting the control signal to a control signal receiver of the audio device.

20. The method according to claim 14 wherein generating the control signal comprises generating a control signal that effects attenuation of the amplitude of the audio signals generated by the audio device when the amplitude of the signal resulting from detecting the audio signal exceeds the reference audio signal amplitude by a predetermined magnitude.

21. The method according to claim 14 wherein generating the control signal comprises generating a control signal that increases the amplitude of the audio signals generated by the audio device when the reference audio signal amplitude exceeds the amplitude of the signal resulting from detecting the audio signal by a predetermined magnitude.

22. The method according to claim 14 wherein generating the control signal comprises generating a control signal that maintains the amplitude of the audio signals generated by the audio device when the amplitude of the signal resulting from

detecting the audio signal is generally the same as the reference audio signal amplitude.

23. The method according to claim 14 wherein detecting the audio signal comprises:

providing an acoustic signal sensor; and

positioning the sensor so as to facilitate reception of the audio signals generated by the audio device.

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